Lion-tailed macaque

Dr. Donald Lindburg with cheetah cub.

Slow loris

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Behavior Offers Clues for Breeding Endangered Species

A healthy male and female cheetah are housed together with expectations of successful breeding. Months later, the pair has consistently failed to mate, and animal keepers are both frustrated and perplexed by their reticence.

A pregnant African elephant is thought to be close to term, but, as with most wild animal species, no one is sure what the animal's exact gestation period is. Anxious keepers and staff keep vigilant watch, looking for signs of impending labor for this species whose breeding record in zoos has been very poor. They will record their observations for use in predicting future elephant births.

The Watching Game

These are but two instances in which a sophisticated watching game at San Diego's Center for Reproduction of Endangered Species (CRES) is playing a key role in perpetuating species which are not only endangered but extremely difficult to obtain from the wild due to decreasing animal populations and increasing governmental restrictions. CRES behaviorist Dr. Donald Lindburg feels that he and his staff have only scratched the surface in using the observed behavior of animals to enhance their breeding potential as well as their general well-being.

"Much as in humans, a good deal of very valuable information with practical applications can be gained from observing an animal's independent and social behavior and then comparing it to the norm. Our greatest problem is that each species is quite different, and for most we simply do not know what the 'norm' is," Lindburg notes. "Few have taken the time before now to develop this information because breeding wild animals was not essential; another animal could always be obtained from the wild. This is no longer so for many species."

Breeding Success

In the case of the cheetah, behavioral studies have literally given new life to a burgeoning breeding program at the San Diego Wild Animal Park. Last year a total of nine cheetah cubs were born after Lindburg, noting that adult cheetahs are solitary animals in the wild and come together only for a brief period to mate, recommended that males and females be kept separate except when the female was in estrus.

The initial success of the park program is most timely. Winston Wildlife Safari in Winston, Oregon, which up until now has been the major breeder of

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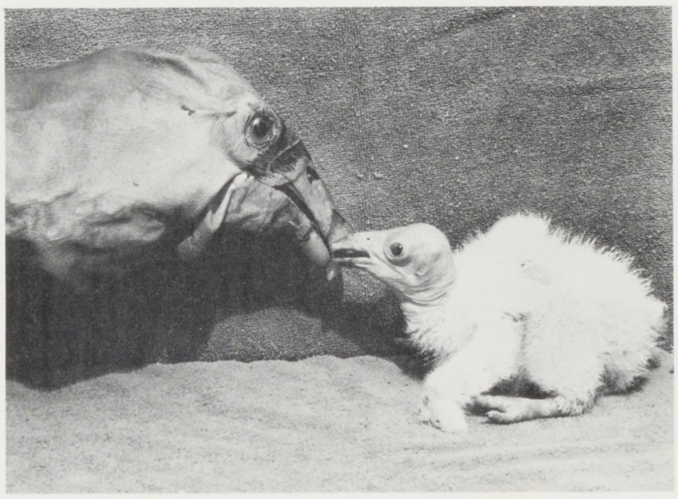
Condor Chick Female Tests Confirm

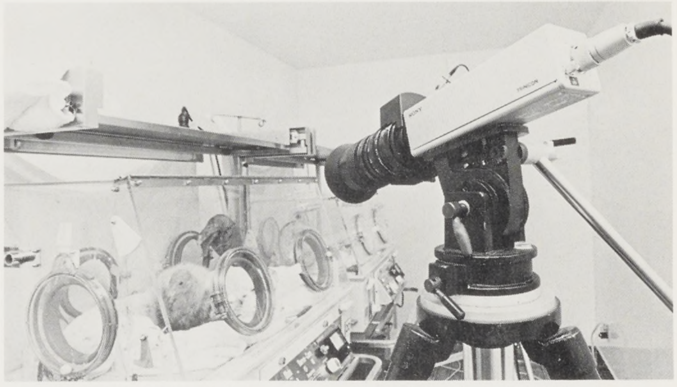


Tecuya, the second California condor hatched in captivity and the first female of the species in zoos.

Hopes for the success of an ambitious program to save the California condor were flying high with recent determination that Tecuya, the second chick hatched in captivity at the San Diego Zoo is a much-hoped-for female. Chromosome analysis of blood samples completed by Arlene Kumamoto of the CRES genetics division confirmed the chick's gender, as well as that of Sisquoc, the first chick hatched in March which was found to be male.

The chromosome study corroborates earlier testing done by avian reproductive physiologist Arden Bercovitz who used an experimental fecal steroid analysis to test residue recovered from the shells immediately after the chicks hatched. Researchers are hopeful that the validity of the experimental method in this project make it reliable for an early determination of sex for future condor hatchlings as well as for other species.

With peak breeding season for the condor now past, participants in the recovery program will be working closely with governmental agencies and the Los Angeles Zoo to develop a management program for the critically endangered bird.



Sophisticated video equipment records the behavior of California condor chicks and other endangered species under study.

cheetahs in this country, recently suffered the loss of a sizeable number of animals due to a lethal virus which brought their number of breeding females down to two. Added to this unfortunate situation is the advancing age of the U.S. wild-caught cheetah population. Very few of this species have been imported since 1972, which means existing animals will soon be too old to produce offspring. Lindburg feels that understanding the reproductive requirements of this species is an urgent and critical need.

The survival of other species may be similarly dependent on the success of zoo breeding programs. The lion-tailed macaque, a handsome primate which is known to have a total species population of fewer than 1,000 in its native India, has been the subject of close attention by CRES staff and student observers during the past four years. Hardy animals, lion-tailed macaques are another species whose breeding record in zoos has been notoriously and inexplicably low.

During extensive observation of the behavior of macaque mothers, researchers documented a tendency to nurse infants much longer than is really necessary, a situation which precludes conception by the female and thus significantly reduces the number of offspring she can produce. Technicians now routinely wean infants at six-to-seven months of age by temporarily removing their mothers from the group, with the intended result of allowing them to conceive again.

Studies of the lion-tailed macaque, which have been conducted at an off-exhibit area of the San Diego Zoo adjacent to the CRES facility, will soon have a rare opportunity for expansion. Eighteen animals of this species which have been exhibited in a private zoo belonging to Prince Ranier of Monaco will be acquired within the next few months by the San Diego Zoo, bringing to 33 the total number with which CRES staff will be working. About 300 of the species are known to be in zoos.

A High-Tech Approach

The techniques which CRES researchers employ take full advantage of sophisticated video and computer technology. Information acquired from firsthand observations is immediately entered into a computer for analysis. The results are often used in the day-to-day management of the species under study. Video monitoring, particularly of pregnant females, is frequently round-the-clock, permitting investigators to keep close watch for impending births without causing unnatural disruptions for sensitive animals involved. Video tapes of live births not only help to monitor potential problems but provide invaluable data which researchers can use in preparing for other births.

Whistling in the Dark

The implications of much of the data behaviorists are presently compiling are not fully known. Working with a newly-acquired colony of slow loris, prosimian primates native to Southeast Asia, researchers have observed that the female of this nocturnal species emits a whistling sound when she comes into estrus. According to Lindburg, the reasons for this unique behavior are still a bit of a mystery, but it may be an important observation for the reproduction of the slow loris, a fragile animal which has very rarely bred in captivity. And, for future studies of primate evolution, work with this species which is among the most primitive of primates has considerable significance.

Condor Curiosity

The California condor, which made conservation history with hatchings in March, April and May at the San Diego Zoo of four eggs taken from the Southern California wild, has also been under constant scrutiny. Video monitors have documented a range of activities from pipping and hatching through each new phase of growth, with condor watchers noting how many times the chicks sit down, stand up, flap their wings and other mostly unremarkable movements. The recording of these routine activities for the California condor has never been before possible, and observers believe that such detail may lead to discoveries that will not only enhance the captive breeding program but which can be used to improve survival chances for condor chicks in the wild. Behaviorists consider this exhaustive documentation a rare opportunity to examine a species which could well be extinct before the turn of the century.

The Center for Reproduction of Endangered Species (CRES) is operated by the Zoological Society of San Diego, a non-profit organization.